in which the red on the nape and breast is commencing, and in which otherwise the transition from the female to the male dress is beginning.

Pucrasia macrolopha (Less.). Kotegurh (winter).

Phasianus wallichi, Hardw. Kotegurh?

Gallophasis albocristatus (Vig.). Kotegurh (winter).

Francolinus vulgaris, Steph. Kotegurh (winter).

Caccabis chukar (Gray). Kotegurh.
Hardly separable from *C. græca* (Briss.).

Arboricola torqueola (Valenc.). Kotegurh.

Coturnix communis, Bonnat. Kotegurh.

Ægialitis pyrrhothorax (Temm.). Kyangsisa.

Totanus glareola (L.). Lake Gyagar.

Gallinago scolopacinus, Bonap. Kotegurh.

Casarca rutila (Pall.). Puga.

Aythya nyroca (Güldenst.). Sirinagur (September).

Sterna hirundo, L. On the Indus near Puga.

XXVII.—*On the Ornithology of Palestine.* Part VIII.

By the Rev. H. B. Tristram, M.A., LL.D., F.R.S., &c.

[Concluded from page 215.]

The *Otididæ* are very scantily represented. *Otis tarda* is said to be found on the Plain of Sharon; I fear it is becoming as scarce there as in Norfolk, and must almost be reckoned with the things that were. However, it is still plentiful on the plains of Northern Syria. Russell (Nat. Hist. Aleppo, ii. p. 202) mentions *Otis arabs* among the birds of Syria; but I can find no trace of this African species in the east, except the statement of Edwards (appended to his admirable plate published in 1743) that Sir Hans Sloane had one alive for many years, which was brought from Mocha. Russell's bird is no doubt the Houbara, which is very common in the Jordan valley, where I have seen it day after day in small flocks, but never succeeded in getting within shot, except when without a gun. As *O. macqueeni* and *O. houbara* are now, I believe, admitted to be synonymous, I need not be troubled with the identification of a bird so familiar to me in North Africa. The favourite food of the Houbara appeared to be the desert-snails so abundant on the scrubby vegetation of the plain. The Little Bustard (*Otis tetrax*) is known to be a vernal visitant in a very different part of the country, the maritime plains; but we did not meet with it; in fact we did not work that district at the proper season. Our head servant, a good shot and keen sportsman (no ordinary accomplishment in a Greek), knew the bird well, and assured me he had often killed it.

Very home-like to the East-Anglian members of our party was the cry of *Œdicnemus crepitans,* heard night after night close to our tents near Jericho, on the same plains that rear the Houbara. We obtained many, as well as several eggs, and found the birds to be of the full size of English specimens, unlike the Indian, which, so far as I have examined them, are invariably so much smaller as to excite my suspicion that Dr. Salvadori was right in distinguishing them specifically as *Œ. indicus,* or that they are at least a distinct race. I also met with *Œ. crepitans* on the sand-dunes near Beersheba.

The other grallatorial birds call for little remark, as, though very numerous both in species and individuals, I have little to note that is not trite and familiar. *Cursorius gallicus* we met with occasionally on the coast, where Mr. Cochrane shot the finest specimen I ever saw. *Pluvianus ægyptius,* I fancy, is only a straggler from the Nile; for though Mr. Herschell possessed one he shot in the Jordan valley*, this is the only recorded instance of its occurrence. The Pratincole (*Glareola pratincola*) disappears in winter, but returns in great numbers to all the marshy plains in spring, when we found them on their breeding-grounds, where they can be shot in any numbers, as they keep hovering over the intruders, undismayed by repeated discharges of the gun. As in Africa, they lay their eggs in a footprint in the barest spots. *Glareola nordmanni* did not occur to us. The Grey and Golden Plovers (*Squatarola helvetica* and *Charadrius*

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* Ibis, 1862, p. 279.

pluvialis) and the Lapwing (*Vanellus cristatus*) are found in the plains and cultivated lands by thousands, but of course only as winter visitants.

The southern deserts are the resort in winter of another group of species—our common Dotterel (*Charadrius morinellus*), *C. leschenaulti*, and *C. pyrrhothorax*. I accept Mr. Blyth's rectification (Ibis, 1867, pp. 163, 164) of my synonymy in a former paper (P. Z. S. 1864, p. 450) for both these last species. No description can give any idea of the continuous flocks which overspread the whole of the southern wilderness during three days' ride from the Arabah to Beersheba. This is not strictly *desert*, but is the "hill-country" or pasture-land of the Old Testament. Hour after hour the birds ran almost among our horses' feet, and we shot as many as we required for the day's provision within half an hour. There were about ten of the Common Dotterel for one of the other species; but all seemed mingled indiscriminately. With them were all the Desert-Larks, rising sometimes in clouds, and here and there a Sea-Gull, strangely out of place in such a landscape. But the myriads of *Helices*, clustering on all the bushes and on every straw, till the whole looked like a sheet of white blossom, no doubt provided sustenance for all. These shells were of more than a dozen species, but all white.

To my former list (P. Z. S. 1864, p. 450), I must now add the true *Charadrius asiaticus* of Pallas, of which I shot a specimen on the shore near Acre in winter, where *C. pyrrhothorax* was pretty common, and especially near the Kishon, generally in company with larger flocks of the universal *Ægialitis cantianus*. The latter breeds in several places in Palestine. *Æ. minor* is much less common; but we obtained it several times on the Kishon, and doubtless it is found on other gravelly spots throughout the country. I think I saw it more than once on the shores of the Lake of Galilee, running with the Kentish Plovers. There, too, in spring I shot, out of a small flock, a specimen of *Æ. hiaticula*, which we also found in winter on the coast. It breeds on the Upper Jordan, near Hermon, but is the scarcest of its group in winter.

The most interesting of the Plover tribe was the Spurwing

(*Hoplopterus spinosus*), which returns as most of its congeners are leaving, and spares no pains, by voice and action, to make its arrival known. We found it everywhere in pairs, by streams or in marshy lands, where it was evidently breeding, though we never lighted on a nest. Its habits as an Egyptian bird are too well known to require particularizing here.

Grus cinerea was the only species of Crane we observed, and that only in winter. At Moladah, about thirty miles west of the south end of the Dead Sea, we chanced to camp close to a roosting-place of Cranes. Hard work and, I hope, a good conscience made us sound sleepers; else the din of the Cranes might have roused an Ephesian. Towards sunset these enormous birds began to return homewards, flying in order, like geese, with outstretched necks, keeping up a ceaseless trumpeting; but, unlike Rooks, they were not all early to bed; for fresh arrivals seemed to pour in for several hours, and the trumpeting continued till morning, with only an occasional lull. The howl of some wandering Jackal would rouse the whole camp; then, after a slight pause, the wail of an Hyæna evoked a deafening chorus; and before daylight began an angry discussion, perhaps on the next day's journey. Parties of some hundreds departed for the south with the dawn; others remained, probably to make up for their broken slumbers, till the sun had risen for a couple of hours. The roosting-place was a group of hillocks covering several acres, and was covered with the mutings of the birds as thickly as the resort of any sea-fowl. It had evidently been occupied for years. I have no reason to think that the Crane ever breeds in Palestine. We did not meet with the Demoiselle (*Anthropoides virgo*), though it ought to occur, being common both east and west of this latitude.

Not even Lac Halloula, in Algeria, can rival the marshes of Huleh (Merom) as a paradise for Herons—with this advantage, that the breeding-places are wholly inaccessible to man. That treacherous swamp, extending for seven miles, with its deadly malaria, affords a secure haven, under its waving tufts of papyrus, for any number of heronries. Sometimes we heard the booming of the Bittern (*Botaurus stellaris*). As we plunged through the rushes on the outskirts of the floating bog, the Little Bittern (*Ardetta minuta*) was flushed every few minutes, while far in we saw large flocks of Buff-backs (*Ardea coromandra*), and smaller ones of Squaccos (*A. ralloides*), going and coming like Rooks over the papyrus-tracts. There it was impossible to approach them. The Night-Heron (*Nycticorax griseus*) kept more on the outskirts of the swamps, just as I have seen him in Algeria and Tunis, in small bands; while the Common and Purple Herons (*Ardea cinerea* and *A. purpurea*) were, in the daytime at least, less gregarious in their movements, but rose singly at all sorts of unsuspected corners. The Little Egret (*A. garzetta*) was common, but scattered, and not very sociable; while the Great White Egret (*A. alba*) was scarcer and very wary, generally in parties of from three to six together. But if the nature of the marshes rendered the heronries here impregnable, we were able to secure specimens of all the species when they were incautious enough to seek a fish dinner in the Lake of Galilee. By Ain-et-Tîn, at the northern corner of the Plain of Gennesaret, is a beautiful little marsh of papyrus and oleander. No greater treat could be afforded an ornithologist than to watch the great White Egrets quietly stalking along the little stream that runs through the swamp, as they fished their way; and here we used to lie in wait till we had completed our file of *Ardeidæ*. All the white species appeared to be only spring and summer visitants; but *A. cinerea* and *A. purpurea*, and the Bitterns, are scattered throughout the whole country in small numbers at all times of the year. Dr. Jerdon seems to doubt the fact of the various species of Herons breeding, as they do in Algeria and Palestine, on tufts of reed, observing, "this is quite opposed to the habits of all the Egrets" (B. Ind. ii. p. 745). It may be so in India when they can find trees convenient; but it is unsafe to draw conclusions from too small an induction, and in these regions there are no trees suitable for them within accessible distance of their feeding-ground*. Even in Ireland

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* [We have been informed, on very good authority, that even in England our common *Ardea cinerea* of old time used to breed in the fens, and that there was a large heronry near Whittlesea, in Huntingdonshire, and another at Feltwell, in Norfolk; in the first the nests were built among reeds, in the last on low sallow-bushes.—Ed.]

I have known the Common Heron breed close to the ground on the islands of the Shannon.

The Glossy Ibis (*Falcinellus igneus*), that common attendant of the Herons, which we used in Africa to compare to the black sheep in a flock of white ones, appears to be very rare in Palestine, and I only once saw it. The Spoonbill (*Platalea leucorodia*) is equally rare, and merely a straggler.

The White Stork (*Ciconia alba*) is a regular though only a passing migrant. During the whole of April it covers the land, suddenly appearing in the south, and moving northwards a few miles a day. Thus we were told, by some travellers who came up to Gennesaret, that the whole country about Samaria was covered with Storks. Two days afterwards they overspread our neighbourhood, not close together, but scattered over hill and valley, plain and marsh alike, steadily quartering the ground, seldom near one another, but generally about a hundred yards apart, picking up snakes, lizards, frogs, or fish, according to the locality. Just after this I had occasion to make a six days' journey to the south-east. The Storks were everywhere, among rocks on the hills, in oliveyards, sandy plains, on the dunghills of villages, on the top of Nebo; they remained apparently till they had cleared off the reptilian harvest, and departed for the north as suddenly as they came. A very few pairs here and there remain to breed, notably among the ruins of Gerash and Amman, perhaps also at Cæsarea. They showed great confidence in man, and are never molested by the natives.

The Black Stork (*Ciconia nigra*) is very different in its habits. It is found all through the winter in small flocks on the barren plains by the Dead Sea, never visiting the upper country. I was told that they build in the oak trees in Bashan, but did not meet with them in my hasty ride through that country.

Of the *Scolopacidæ* I may say, shortly, that we obtained nearly every species on the European list during the winter, but that scarcely any remain to breed. The Avocet (*Recurvirostra avocetta*) is a resident, but very scarce; the Stilt (*Himantopus candidus*) is not unfrequent in shallow waters, and breeds on a small marshy lake in the centre of the country near Jenin. Both these remain throughout the year. Curlews we often saw, but never obtained. *Numenius arquata* was certainly one species on the coast; but whether the other smaller bird was *N. phæopus* or *N. tenuirostris* I cannot say. The Sanderling (*Calidris arenaria*), Greenshank (*Totanus glottis*), Wood Sandpiper (*T. glareola*), Green Sandpiper (*T. ochropus*), Redshank (*T. calidris*), Dunlin (*Tringa alpina*), Curlew-Sandpiper (*T. subarquata*), Little Stint (*T. minuta*), Common Sandpiper (*Actitis hypoleucus*), Woodcock (*Scolopax rusticola*), Snipe (*Gallinago media*), Jack Snipe (*G. gallinula*), and *Totanus stagnatilis* were all obtained by us,—*Totanus ochropus,* which was very common as late as June, long after all the others had left. Several of these species we found on the Dead Sea, and at its southern end. On one occasion Mr. Upcher brought down a *Bubo ascalaphus* and a Woodcock by a double shot, out of a cave high up in the side of a bare and treeless dry ravine, out of which they were startled by my shooting a Wall-Creeper (*Tichodroma muraria*).

Of the *Rallidæ,* the Corncrake (*Crex pratensis*), Water-Rail (*Rallus aquaticus*), Water-hen (*Gallinula chloropus*), Coot (*Fulica atra*), and *Porphyrio hyacinthinus* are all permanent residents, *Crex pratensis* in particular being universally diffused and met with at all seasons. The smaller Crakes, *Crex porzana* and *C. pygmæus,* we did not find, though they doubtless exist in suitable localities.

We were rather surprised at bringing down a Flamingo (*Phœnicopterus antiquorum*), in fine adult plumage, on the Kishon, near its mouth, where there is scarcely any cover, and where a few were generally to be seen in winter. We also occasionally saw a flock high in the air elsewhere, but never discovered their breeding-place, though in July a very young bird was shot close to the place where we procured our first specimen.

Cygnus olor, though common in Greece and Egypt, I did not procure; but a fine adult specimen of *Cygnus ferus* was brought to me in the flesh at Jerusalem, on December 26, through the kindness of Dr. Chaplin, our medical missionary there. It had been shot on the Pool of Solomon two or three days before. I believe this is by far the most southern locality yet quoted for the species. I found, however, that the Swan was known by name and sight to our Arabs, who of course did not discriminate the species. Of other *Anatidæ, Chenalopex ægyptiacus* is not uncommon both on the coast and by the Dead Sea, near which latter we found also *Casarca rutila,* in winter, and were also fortunate enough to obtain its eggs in a cliff in Northern Galilee among some Griffons' (*Vultur fulvus*) nests in May. The most common Ducks on the Jordan in winter were *Fuligula ferina* and *F. nyroca.* The former was also very common all along the Dead Sea, swimming on its surface for purposes best known to itself. The latter we often saw long after the Pochards had left. *Anas boschas, A. crecca,* and *Mareca penelope* were common everywhere. We also obtained *A. strepera, A. acuta, Rhynchaspis clypeata, Fuligula cristata,* and *Mergus serrator* in various parts of the country, the latter being very abundant along the seashore. *Mergus albellus* was once obtained on the coast. *Anser segetum, Bernicla brenta, Fuligula marila,* and *Œdemia nigra* also occurred on the coast, while *Erismatura mersa* might be seen on the Lake of Galilee diving about at any time of the year, and doubtless breeding in the marshes of the Huleh. But the most interesting of the duck tribe was *Anas marmorata,* which we found only in the Huleh, and in great numbers, though very wary and breeding there in places wholly inaccessible. In June it was the only duck we could find there, excepting a stray Teal and now and then a *F. nyroca,* while hundreds of this rare Marbled Duck rose as we approached the openings in the swamps, but always out of shot.

The Sea of Galilee is remarkable for the vast numbers of Grebes, Gulls, and Terns which cover its surface in winter and early spring, while after April not a solitary example of a Natator can be detected. Well may birds swarm there, for the shoals of fishes are almost incredible. Masses of fishes covering an acre or two may be seen with their back fins above the water, looking, as they move slowly in serried ranks, like the pattering of a heavy shower on the lake. Why all the birds disappear in May can only be accounted for by the absence of any secure breeding-places near the lake, the shore being open, destitute of trees, marshes, or other cover, and, on the east side, forming a long bare range of bleak hills which come almost down to the water's edge. This we noticed, that none of the birds quitted the lake until after they had assumed the full breeding-plumage. In the month of March its placid surface was dotted all over by Grebes, dispersed in every direction, with here and there a White-headed Duck (*Erismatura mersa*), quietly dipping and diving as we approached the shore or as our boats glided near them.

The only three species of Grebe were *Podiceps cristatus, P. nigricollis,* and *P. minor*. Perhaps the second was the most numerous, though all were in amazing numbers. Some had assumed the breeding-plumage at the beginning of March; indeed I got a Great Crested Grebe, with the finest tippet I ever saw, on the 29th of February. The Eared Grebes are large, a trifle larger than Algerian specimens, and very much larger than South-African*. These two quietly move up the Jordan to the marshes of Merom to breed, while the Little Grebe is dispersed more generally in all the nooks and corners of the country; I have found its eggs in a piece of water no bigger than a horsepond.

The inhabitants of Tiberias have a curious version of the old Bernacle story adapted to the Grebes. There is a fine *Unio*, very solid and oblong, *U. terminalis,* found in the lake. Knowing we were looking for eggs, the fishermen brought us one morning a great basket of these mussels, assuring us they were Grebes' eggs! They gravely maintained their assertion, which we found was the common belief, on the ground that no one ever found any other Grebes' eggs, that the Grebes were constantly diving down in the part where these shells were, and for what else could they dive but to lay these eggs? and, finally, if they were not Grebes' eggs, and being sat upon by the Grebes under water, what had become of the Grebes? for no one ever saw them from the beginning of breeding-time till the summer, when they reappeared from the bottom with their young families! This was surely conclusive!

In winter we found all these species of Grebe also on the Dead Sea, especially near the mouth of the Jordan, where they feed on the fry that are carried down, and which soon become "red herring alive" in the briny solution of the lake.

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* [*Vide antea*, p. 263.—Ed.]

The Gulls and Terns are equally abundant with the Grebes in the winter and spring on the Sea of Galilee. From morning to night they pass and repass up and down its short length—the magnificent *Larus ichthyaetus* in particular making the circuit of the lake close to the edge and always within shot, as though to keep himself in exercise. We got this royal Sea-Gull, in the finest possible plumage, in the month of March. Where they go to breed I cannot say; they certainly do not breed in Palestine; probably they take an easy flight to the Red Sea and enjoy their spring among its coral-reefs*. In fact we could not find a trace of any Gulls or Terns breeding in the country, except *Sterna hybrida*, in the Huleh marshes.

I have seen no figure or description which does full justice to *Larus ichthyaetus* in breeding-plumage. The bill of one I shot on the 29th of February was a rich orange from base to tip, with a black bar across both mandibles near the tip, analogous to the black bar across the coral-red bill of the Mediterranean Gull (*L. melanocephalus*). The tarsi and feet were rich yellow with a greenish tinge, not flesh-coloured, which I imagine is the livery of the younger bird; and there is a purity and distinctness in its plumage unrivalled, I think, in any other Gull. I also obtained *L. ichthyaetus* in winter plumage near the mouth of the Kishon in December. The most abundant Gull on the Lake of Galilee was *Larus audouini*, which we obtained also on the Dead Sea, all along the Jordan, on the Mediterranean coast, and even, as mentioned above, in the southern wilderness. *L. fuscus*, *L. canus*, and *L. ridibundus* are also found on the Lake of Galilee, and were met with in plenty on the coast in winter. The commonest coast Gull is *L. argentatus*, or rather that small variety of it distinguished as *L. leucophæus*, Licht. The rare *L. gelastes*, Licht., and *L. melanocephalus*, Temm., were also on the coast, but we did not meet with them on the inland waters.

Of the Terns, *Sterna velox*, not observed by us on the coast, and *S. hybrida* remain in small flocks on the Sea of Galilee, till they acquire the breeding-plumage, when *S. velox* disappears and *S. hybrida* retires to the marshes of Huleh for nidification. The only other species obtained were *S. anglica,* on sand-spits and small lagoons north of Beyrout, *S. caspia, S. nigra,* and *S. minuta.* The Mediterranean Shearwater (*Puffinus barolii,* Bonelli), so like our own *P. anglorum,* and scarcely differing except in its brown-black plumage, may be seen skimming along shore, and I picked up one under Mount Carmel. Both species of Pelican are recorded among the birds of Palestine; but *Pelecanus crispus* was the only species that came under my own observation. I saw adult specimens of both in a local collection at Beyrout, and there is no reason to question their claim to a place in the list. *Phalacrocorax carbo* is very abundant on the coast, and also regularly visits the mouth of the Jordan, where I little expected to meet with him, sitting on a "snag" and watching for the stupefied fishes. The only other species of Cormorant met with was *P. pygmæus,* on the Leontes and other streams flowing into the Mediterranean. We did not observe it on the Jordan, where, however, it might easily have have escaped our notice.

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* [It may be inferred from Pallas's account (Zoogr. R.-As. ii. p. 323) that they breed on the shores of the Caspian Sea. (*Cf.* P. Z. S. 1867, pp. 166, 167).—Ed.]

The Ostrich, *Struthio camelus,* only claims a place in the fauna of Palestine by its occasional appearance in the Belka, on its south-east extremity, where it is a straggler from Central Arabia. Xenophon speaks of its abundance in his time in Assyria (Anab. i. cap. 5); and we have traditional accounts of its former existence as far east as Scinde. All the other wild animals named by Xenophon are still found in the region of the Euphrates and Tigris—a fact which makes the rapid retrocession of the Ostrich the more remarkable. But, from the very frequent reference to this bird throughout the Scriptures of the Old Testament, it was evidently familiar to the Jews, and, no doubt, roamed through the southern wilderness and Arabia Petræa as well as on the eastern frontier. I possess a portion of an Ostrich's skin (the back, neck, and wings), intended for a sort of mat of state, which had been captured in the Belka by the Sheikh Aghyle Agha, and given by him to my friend Mr. T. B. Sandwith, when Consul at Caiffa.

My notes have now embraced 329 species. Closer research will no doubt add many more to the list; but a catalogue of over

300 spe cie in one small district of the Mediterranean basin, comprising 27 peculiar and 9 new species, affords ample encouragement to our ornithologists to complete the investigation, and to work out the avifauna of Asia Minor, Northern Syria, and the Euphrates-valley, of which our knowledge is almost a blank.

In the course of these papers it will be observed that I have had to make several corrections in, and additions to the list published by me shortly after my return (P.Z.S. 1864, pp. 426–456). The principal corrections are the omission (Ibis, 1866, p. 283) of *Cuculus libanoticus,* then described as a new species, but of which I now feel very doubtful; the identification (*tom. cit.* p. 291) of *Motacilla lugubris,* Temm., with *M. vidua,* Sund., the substitution (*tom. cit.* pp. 291, 292) of *Cinclus albicollis,* Vieill., for *C. aquaticus,* Bechst., var.?, the correction (*op. cit.* 1867, p. 79) of *Cettia sericea,* Bp., to the new species *C. orientalis,* and (*antea,* p. 331) of *Puffinus anglorum* to *P. barolii,* Bonelli. The additional species given are *Sitta cæsia,* Mey. (*op. cit.* 1866, p. 285), *Drymœca eremita,* sp. nov. (*op. cit.* 1867, p. 76), *Sylvia bowmani,* sp. nov. (*tom. cit.* p. 85), *S. doriæ,* De Filippi (*tom. cit.* p. 84), *Charadrius leschenaulti,* Lesson (*antea,* p. 323), and, perhaps (*op. cit.* 1866, p. 286), a *Melanocorypha,* as yet unnamed by me, but closely allied to *M. calandra.*

As to the general conclusions deducible from a review of the Palestine avifauna, I indulged in various speculations in the first paper of this series. These I need not repeat; but I would call attention especially to the fine illustrations which Palestine affords of the fact that as zones of elevation or mountains correspond to parallels of latitude, the higher zones corresponding to the higher latitudes, so here a zone of depression, the only one of any importance known to us, produces similar phenomena, and exhibits, in generic correspondences, specific representations, and, in some cases, specific identities, the avifauna of lower latitudes. The Ethiopian and Indian forms are almost exclusively confined to the deep depression of the Dead-Sea basin, which, with the exception of some winter migrants, affords very few Palæarctic species.

Of the 36 birds pertaining to the Ethiopian avifauna, 16 species have not been found in Palestine out of the Dead-Sea basin. As to the occurrence of desert species, no difficulty can arise, especially in the case of such as extend through the whole belt of sandy waste which girdles the Old World from Scinde to the Atlantic coast of Africa.

The most interesting of the Indian non-Ethiopian species is *Ketupa ceylonensis*; and the occurrence of this great fish-eating Owl is the more exceptional, as there are no *Strigidæ* in Africa bearing the least affinity to this well-marked genus, and since it has not yet been found in the Jordan valley, but only sedentary by the streams of the coast. *Alcyon smyrnensis* and *Turtur risorius,* which are both sedentary in the Jordan valley, are the only other instances of so great a westward extension of purely Indian forms; but both have appeared as stragglers in Asia Minor, whence the former was known to Linnæus, but lost to science till recently rediscovered there by Capt. Graves, R.N.

Of the 27 species classed as new or peculiar to Palestine, 11 are merely modifications or representative forms of familiar types, and are all found in the upper country or on the coast. Such are *Garrulus melanocephalus, Picus syriacus, Cettia orientalis, Saxicola eurymelæna,* and *S. amphileuca.* Several of the other new species are closely allied to known desert or oriental forms, and are found beyond the limits of the Dead-Sea basin. Such are *Hypolais upcheri, Petronia brachydactyla,* and others. One, *Ruticilla semirufa,* inhabiting the hill country, is clearly an affine of the Indian *Ruticillinæ,* and not of the Ethiopian or Palæarctic members of the genus. But there are 11 species, belonging to as many different genera, peculiar to the Dead-Sea basin, and not yet traced beyond its limits. Some of these belong to genera exclusively Ethiopian, most of them to genera common to the Ethiopian and Indian regions; but the affinities of two at least are Indian and not African. *Caprimulgus tamaricis* is, perhaps, most closely related to *C. asiaticus* of India, but with the characteristic plumage of *C. isabellinus* of Africa. *Passer moabiticus,* another well-marked species, strictly confined to the lower end of the Dead-Sea basin, though it belongs to a genus equally Ethiopian and Indian, yet must undoubtedly be included among the Indian portion of that group. The smallest species known of its genus, in its coloration and other peculiarities it approximates in some respects to the Indian *P. cinnamomeus,* in others to the *P. russatus* of China, but is not affined to any known Ethiopian *Passer.* *Ammoperdix heyi,* a Partridge limited in its range to the region round the Dead Sea and Arabia Petræa, belongs to a subgenus of *Caccabis,* the only other member of which, *A. bonhami,* is Indian.

Of other peculiar species, *Ixus xanthopygius,* belonging to a genus widely extended through both regions, yet is very close to five or six Ethiopian species, and more decidedly separated from any of its Indian congeners. *Nectarinia osea,* the only one of this numerous genus which reaches so far north, represents a family very numerous in both regions. Though not far removed from *N. asiatica,* it approaches much more nearly to *N. affinis* of Abyssinia. *Crateropus chalybeius,* yet more circumscribed in its range to the lower part of the Jordan valley, above which it never ascends, is one of a peculiarly well-marked genus, comprising about 18 species, all exclusively African, while *Amydrus tristrami* (the last to be named), is one of a restricted group of Starlings, of which the two other species are Abyssinian and South-African. None of the Indian *Sturnidæ* have any near affinities with this genus.

We are naturally led to speculate on the means by which this narrow region became peopled. That it was by special creation within this area, or that its inhabitants can have had an independent origin on the spot, is negatived by the fact of the identity of many species of animal life, and of almost the entire flora, with species now flourishing in the Ethiopian region.

That it was peopled by migration in modern times, or that wandering individuals in search of new homes, finding the conditions adapted for their existence, settled and colonized, and, in the case of birds, abandoned their migratory habits, is met by the fact of the coexistence of peculiar forms with others now found in regions remote from the colony. Besides which, there are species which, making due allowance for all probable modes of migration, could scarcely have been transported thither under present conditions, since either their physical character or the phenomena of their present distribution forbid such a supposition. We are thus led to the hypothesis that these species arrived by migration or general dispersion before the surrounding region presented the existing obstacles to their transport.

This must at least have been after the close of the Eocene period, to which belong all the most superficial deposits of southern Palestine. It must have been before the Glacial epoch, which has left traces of its effects over the whole country. Before this period we have reason to believe a warm period occurred. The fauna and flora of Palestine would then be East-African, either identical or representative. Afterwards, in the period of cold, those species which were most tenacious of life, retiring to the depression of the Jordan valley, then, as now, proportionally warmer than the surrounding land, contrived to maintain the struggle for existence, and have survived to the present day to form "a tropical outlier," of which we have no other terrestrial instances, but parallel with the northern outliers of marine life which occur in the British seas.

In like manner the supervening Glacial period has left its mark in the avifauna of Hermon and Lebanon. It is needless to enter further on this subject, as the question becomes one of geology rather than of ornithology, and I have already treated of it elsewhere. But it is a fair illustration of the way in which the various branches of natural science are interwoven, and of the value of the examination of even a limited geographical area. To me, and to all of us, the great attraction of Palestine-natural exploration must be its connexion with Sacred History, and its bearing on the minor elucidations of Scriptural allusions. But apart from the connexion of the subject with that of the language and expressions of the inspired writers, I venture to hope the readers of 'The Ibis' may have found enough of ornithological illustration in the investigation to excuse the length to which during four years these papers have run on.

XXVIII.—*Notices of Recent Ornithological Publications* :—

1. English.

SINCE our last notice of their work* (Ibis, 1867, p. 372) our friends the authors of 'Exotic Ornithology' have issued their

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* Exotic Ornithology. By PHILIP LUTLEY SCLATER, M.A. &c., and OSBERT SALVIN, M.A. &c. Parts iv., v. & vi. London. Imp. 4to.